



G. B. Orazi's Enharmonic Flute and Its Music (1797-1815)

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IN 1797 Giovanni Battista Orazi, amateur flautist and composer of the Kingdom of Naples, published a short treatise illustrating his invention of a new type of transverse flute. Issued at the same time, though printed separately, were two trios written specially for performance on the same instrument. The aim of the invention was to make the flute more competitive with the violin by: (1) extending its range to the lower fifth, thereby allowing it to descend chromatically from *d'* to *g*; (2) increasing the upper range and facilitating the emission of the higher notes; and (3) enabling it to perform quarter-tones so that portamento effects could enhance the instrument's expressive potential.

Hitherto our knowledge of the subject has been limited to the content of these two works (just two copies of which survive). Important new information, however, has been acquired by the fortuitous discovery of certain documents. The first, an anonymous manuscript recently purchased in Naples by Friedrich Lippman (who kindly brought it to my attention), throws light on what happened to the instrument after Orazi's death. It not only directly reports the opinions on the instrument of certain well-known composers, including Paisiello and Fenaroli, but also testifies to the wide use of portamento by not only singers but also violinists. Its author may be securely identified as Paolo Anania de Luca (1778–1864), Neapolitan scholar well known in his day for his studies in the field of musical acoustics.¹ Also described are De Luca's attempts to construct a bass flute, an instrument practically unheard of at the time. On the strength of this document it has been possible to trace two wills, both drawn up by Orazi in the year of his death (1804). These documents provide the only extant biographical information on this inventor.

The following sigla are used in the present article:

[S] Giovanni Battista Orazi: *Saggio per costruire e suonare un flauto traverso enarmonico che ha i tuoni bassi del violino con due trii di genere enarmonico misti*. Rome: 'nella stamperia di Michele Puccinelli a Tor Sanguigna', 1797. The separate booklet containing the two trios, in separate parts and

¹ See Paolo Emilio Imbriani: *Parole epicedie per Paolo Anania De Luca professore ordinario della Università Napoletana pronunziate dal Rettore di essa . . .* (Naples, 1864).

without the composer's name, is entitled *Due trii di genere enarmonico misti per tre traversi di nuova costruzione*. Rome, 'nella calcografia Franzetti a Torsanguigna', no date. The title-pages of both publications specify that they were on sale in Naples 'dai Fratelli Delia, strada S. Carlo num.º 46'.² [De] [Paolo Anania De Luca], *Origine, vicende, critica ed aneddoti delle mie ricerche acustico-musicali*, [Naples, mid 19th century]. Manuscript preserved in Rome, Deutsches Historisches Institut, Musikgeschichtliche Abteilung (the subject in question is dealt with on pp. 3-28).³

1. ORAZI'S WILL (1804)

Biographical information on Orazi is very scant. From the De Luca manuscript we learn that he was from Amatrice, a small town on the extreme northern borders of the then Kingdom of Naples.⁴ This enabled me to track down his two wills (which differ only in certain points of detail), from which I will here outline the data of musical interest.⁵

We learn that Orazi spent long periods in Naples and Spain as an army lieutenant and that on retirement he returned to Amatrice, where he lived with his brother Nicola, whom he appointed sole legatee. He died on 16 or 17 March 1804 after a long illness.⁶ From the list of his possessions we assume that he was well off. The numerous paintings in his possession included one by [Luca] Giordano of a bagpipe player. Mention of his flutes leads him to refer to the complicated enharmonic

² To my knowledge, only the following copies survive: Washington, Library of Congress (*Saggio* and *Trii*); Naples, Biblioteca del Conservatorio S. Pietro a Maiella (*Saggio* only); Trieste, Civico Museo Teatrale della Fondazione Carlo Schmidl (*Trii* only). The Trieste copy is mentioned in Giancarlo Rostirolla, 'L'editoria musicale a Roma nel Settecento', in *Le muse galanti. La musica a Roma nel Settecento*, edited by Bruno Cagli (Rome, 1985), p. 158.

³ These manuscripts are at present being catalogued and as yet without shelf mark. They were purchased in Naples (in an antiquarian bookshop, around 1970-72) by Friedrich Lippmann, the then director of the music history section of the Deutsches Historisches Institut in Rome.

⁴ [De, 14]. Amatrice was annexed to the Kingdom of Naples in 1743: see: Andrea Massimi, *Itinerari Amatriciani...* (Rome, 1971), p. 18.

⁵ Both preserved in L'Aquila, Archivio di Stato: notaio Antonio Callidi, b. 2405, respectively 8 February and 17 March 1804. The latter date is that of the opening of the second will, drawn up on the 12th of the same month. As the opening took place in the presence of the deceased, we may plausibly infer that Orazi died on either the 16th or the 17th. I thank Dott.ssa Vincenzina Celli of the state archives for unearthing these documents.

⁶ Both wills are very cool towards three other brothers and a sister, who (he declares) should rather be indebted to him for his having defended them in court on several occasions from numerous charges (both civil and criminal). He asks to be buried at the church of S. Francesco at Amatrice in the tomb of his father Virgilio.

transverse flute of his own invention (along with various copies of the 1797 *Saggio*, containing the copperplate engraving of the instrument; see Fig. 1):

A case containing a glass flute, other valuable ones of ebony, such as the one in the small drawer, and another of my invention with many keys, along with the copperplate mould [representing it] and various printed copies.⁷

He also mentions his sacred compositions and an enharmonic scale for tuning the harpsichord that is clearly the same as that prescribed for the flute:

I leave all my compositions of sacred music to the bishop who will succeed his excellency Cardinal Archetti to the bishopric of Ascoli; but only if the said succeeding bishop should be Monsignor Passeri, who was vicegerent in Rome and who examined – and approved of – some musical discoveries of mine; in particular I bequeath to him an enharmonic scale that is recommended for the tuning of an enharmonic harpsichord – it is to be found among my papers on a half-sheet bearing the words *Ave Maris Stella*.⁸

It is not known whether he used this tuning also on the harpsichord he kept at home, about which the document says nothing except that he was very jealous of it.

From the two wills we deduce that Orazi made at least two visits to Rome, a city with which, for geographical reasons, the Amatriciani had close ties. It was there that he had his short treatise printed, by two printers, M. Puccinelli (typographer) and Franzetti (copper-plate printer), who conducted their business in two neighbouring workshops just a few yards from Piazza Navona.⁹ It was in Naples, however, that the work was actually sold, as we read from the title-pages of both the *Saggio* and the *Triti*.

⁷ From the will of 8 February: 'Uno stuccio, che conserva un traverso di cristallo, altri di ebano di valore, come quello che stà nel cassetto, e un'altro di mia invenzione – di cui vi è il rame, e varie copie in istampa – con molte chivette'.

⁸ This clause appears only in the will of 12 March: 'Lascio al vescovo successore dell'ecc.mo cardinale Archetti nel vescovado di Ascoli tutte le mie composizioni in musica sacre; nel solo caso però, che detto vescovo successore sia monsignor Passeri, che fu vicegerente in Roma, rividde, ed approvò alcune mie scoperte in musica, e particolarmente gli dono una scala enarmonica, di cui ne abbia a tenere molto conto per l'accordo del cembalo ridotto all'enarmonico, la quale deve trovarsi tra le mie carte in un mezzo foglio, dove vi è scritto l'*Ave Maris Stella*.' As regards Francesco Saverio Passari (this is the correct spelling of the name, although in Orazi's will it is misspelled as 'Passeri'), we know that he was vicegerent of Cardinal-Vicar Marcantonio Colonna from 1786 to 1800 before moving on to the joint diocese of Ancona and Numana as apostolic administrator. He died at Montegiorgio (near Ascoli Piceno) on 4 April 1808: see Niccolò del Re, *Il vicegerente del Vicariato di Roma* (Rome, 1976), p. 68. It is not known what happened to the compositions mentioned by Orazi.

⁹ See Patrizio Barbieri: 'Musica, tipografi e librai a Roma: tecnologie di stampa e integrazioni bibliografiche (1583-1833)', *Recercare* VII (1995), pp. 74-75, 77-78.

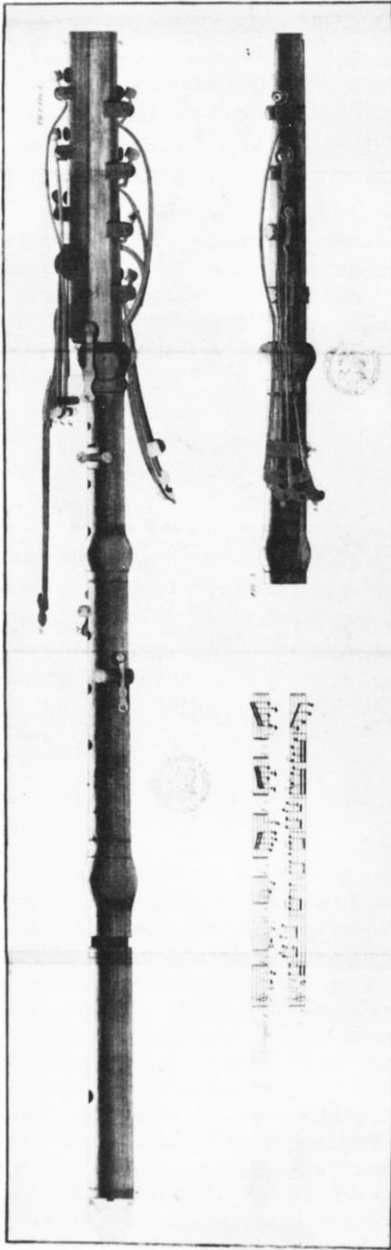


Fig. 1. Orazi, Saggio, 1797, Table I (Naples, Biblioteca del Conservatorio S. Pietro a Maiella). The upper illustration shows the complete flute; the lower just the bent-round foot joint (DCB). The latter section shows the seven open-standing keys, which – starting from the low G ‘of the violin’ – give the successive notes g, g[#], a, b^b, b^b, c’ and c[#]’. In the central part of the instrument we see the four keys of the customary concert flute in D (i.e. E^b, F, G[#], B^b). In all, the instrument has 17 tone holes, six of which are keyless.

2. THE OPINIONS OF PAISIELLO AND OTHER COMPOSERS ON ORAZI'S FLUTE (NAPLES, 1807)

From De Luca's manuscript we learn that Giovanni Battista Orazi had died without leaving any pupils ('senza lasciare alcun allievo') and that not even the inheritor of the enharmonic flute, his brother Nicola, knew what to do with the instrument [*De*, 15]. We learn, however, that in 1814-15 Nicola Orazi was in Naples, where he entered into friendly relations with De Luca and even lent him the flute – which by then had fallen into disuse – so that he could examine it at his leisure. He also told De Luca that in 1807 he had contacted the Minister of the Interior with a view to selling the instrument and having it adopted by the Reale Collegio di Musica, at the time directed by Fenaroli, Paisiello and Tritto.¹⁰ As Nicola Orazi's price was a high one (12,000 ducati), the Minister referred the matter to three authoritative composers, who duly presented written reports. De Luca later tracked down these reports in the ministry's archives and quoted them complete in his manuscript [*De*, 15-26]. An outline of these opinions follows.

The first to be contacted was Cervelli, 'excellent master of counterpoint',¹¹ who spoke in favour of adopting the instrument. But as his recommendation was not considered sufficient, the Minister turned to Fenaroli and Paisiello, who instead gave an unfavourable opinion. Their arguments could be summarised as follows: (1) 'the genre of music' for this instrument is non-existent; and (2) the instrument is 'built in a completely different way from that used at the present time', since the flute then in use had 'one key only' (i.e. *E^b*).¹² In their report we also read that the same opinion was expressed by 'two of this country's fine flute artists, Sig. Gravina and Sig. Fiore, whom we approached for this very purpose'.¹³

The Minister then returned to consult Cervelli, whose answer to the

¹⁰ [*De*, 12-15]. On the Reale Collegio di Musica, the institution founded in 1806-07 from the fusion of the sole two surviving Neapolitan conservatories and later to become the present Conservatory of S. Pietro a Maiella, see Francesco Florimo: *Cenni storici sul Collegio di Musica S. Pietro a Majella in Napoli* (Naples, [1873]), p.9.

¹¹ [*De*, 15]: 'Valentissimo maestro contrappuntista'. This clearly refers to Giuseppe Cervelli, pupil of the Neapolitan Alessandro Speranza: see: Robert Eitner, *Biographisch-Bibliographisches Quellen-Lexicon* . . . (Leipzig, [1900-1904]), Vol.2, p.395.

¹² [*De*, 17-18]: '1° – Per avere il desiato intento, che possa farsi di un tale istrumento; manca ad esso il genere della musica.' In addition, the flute professors were unfamiliar with Orazi's flute, 'il quale è costruito tutto diversamente da quello che presentemente si fa uso, essendo formato con una chiave sola...'

¹³ [*De*, 19]: 'Tali osservazioni sono unite [sic] a quei de' due bravi artisti di flauto traverso del nostro paese Sig.r Gravina e Sig.r Fiore, che abbiamo fatto intervenire espressamente per tale oggetto.'

two objections ran as follows [*De*, 19–26]: (1) the quarter-tones have the sole purpose of allowing one to introduce into ordinary compositions a sort of ‘chiaroscuro’ effect, i.e. ‘inflections of the voice’ highly suited to expressing the ‘motions of the soul’ (we shall return to these concepts below in §4); and (2) if one restricts oneself to the diatonic–chromatic genre, Orazi’s flute can be perfectly easily played like any ordinary one-keyed instrument (and he also adds, somewhat polemically, that ‘Potter’s flute, which has five keys, is in common use throughout Europe’).¹⁴

In this report Cervelli adds that the flute had not been used ‘da molti anni’ (i.e. for many years before 1807) and was therefore unplayable because of the malfunction of the keys. He concludes by saying he had discussed the subject with ‘a certain Capuchin friar, P. Luigi of Turin’, whom he considered the only person capable of restoring the instrument, since he knew both the instrument and its inventor, whom he had ‘heard play it several times’ (‘molte volte sentito sonare’). When Orazi was alive, therefore, his flute had actually been used, which confirms De Luca’s remark: ‘Tradition has it that this instrument was played by its inventor and by certain of his friends to the great delight of those who heard’.¹⁵

In the light of Cervelli’s second report the minister declared he would re-examine the proposal only when the flute had been repaired, but as Orazi found nobody prepared to do the job, negotiations ended there [*De*, 26]. Today we have no way of knowing about the instrument’s eventual fate.

3. THE INSTRUMENT

Orazi’s instrument was essentially a normal concert flute in D (*flauto corista*) equipped with four closed-standing keys (E^b , F , G^\sharp , B^b). To it was added an extension partly bent back on itself – for a more convenient positioning of the keys (Fig. 1) – allowing one to play chromatically from d' down to g using seven open-standing keys (see fingerings in Fig. 2). It was not, therefore, a transposing instrument pitched a fifth lower,

¹⁴ [*De*, 23]: ‘il flauto di Potter, che ha cinque chiavi, è comune in tutta l’Europa, e particolarmente in Parigi si costruiscono a perfezione, come può osservarsi da quello del nostro Sig.r Alessio Fasulo.’ It worth remembering, however, that in 1795 the f , g^\sharp and b^b keys were still not in general use, not even in Paris: see: Richard Shepherd Rockstro, *A Treatise on the Construction, the History and the Practice of the Flute...* (London, 1890, reprint 1928), p.257. This is confirmed by the physicist and amateur flautist Jacques-A.-C. Charles: see: Patrizio Barbieri: ‘Musical instruments and players in J.-A.-C. Charles’s *Acoustique* (Paris, c.1787–1802) and other French technical sources’, *Journal of the American Musical Instrument Society*, XXIII (1997), pp.109–110.

¹⁵ [*De*, 15]: ‘Stando alla tradizione, tale strumento fu sonato dall’autore e da taluni suoi amici con sommo diletto degli uditori.’

as was for example the alto flute illustrated in the *Encyclopédie* (1756), to which I shall refer below.¹⁶

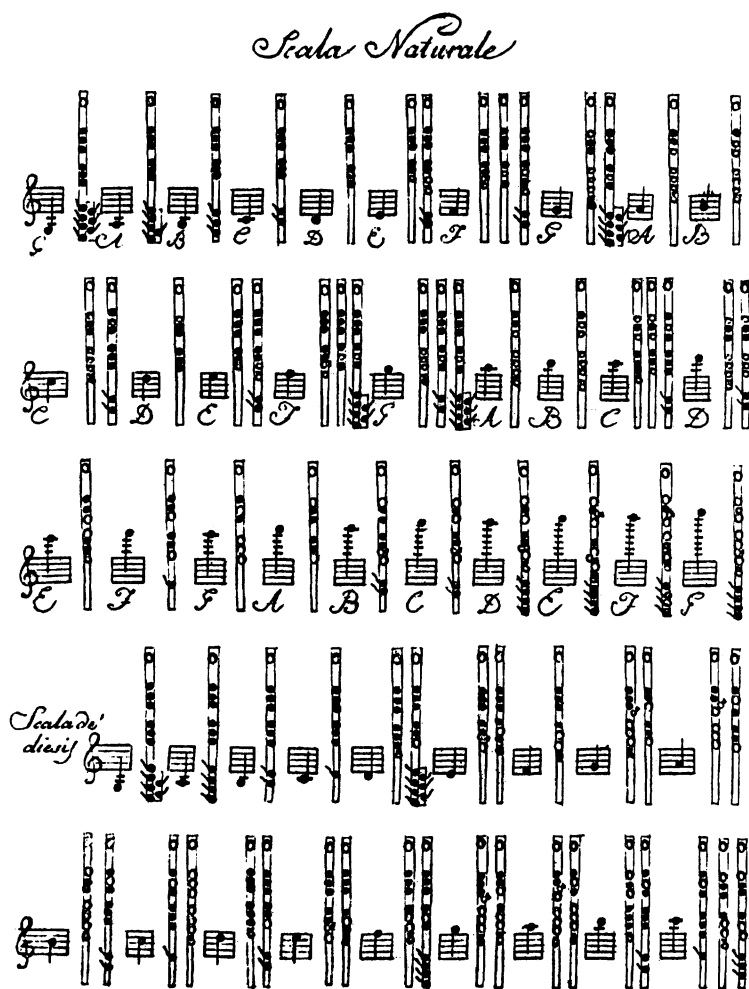


Fig. 2. Orazi, *Saggio*, 1797, first page of fingerings and first four rows of page 2. The first three rows show the natural notes ($g - g'''$), the other six show the same notes sharpened ('Scala de' diesis') and flattened ('Scala de' bemolli').

¹⁶ *Encyclopédie ou Dictionnaire raisonné des sciences des arts et des métiers* . . . (Paris, 1751), Vol. 2, p. 120 ('Basse de Flûte traversière'); Id., *Recueil de planches* . . . (Paris, 1767), Vol. 5, Planche IX, Figs. 34-38. On this instrument, see also: (i) Rockstro: *A Treatise*, pp. 238-9; (ii) Philip Bate: *The Flute* . . . (London & New York, 1975), p. 186.

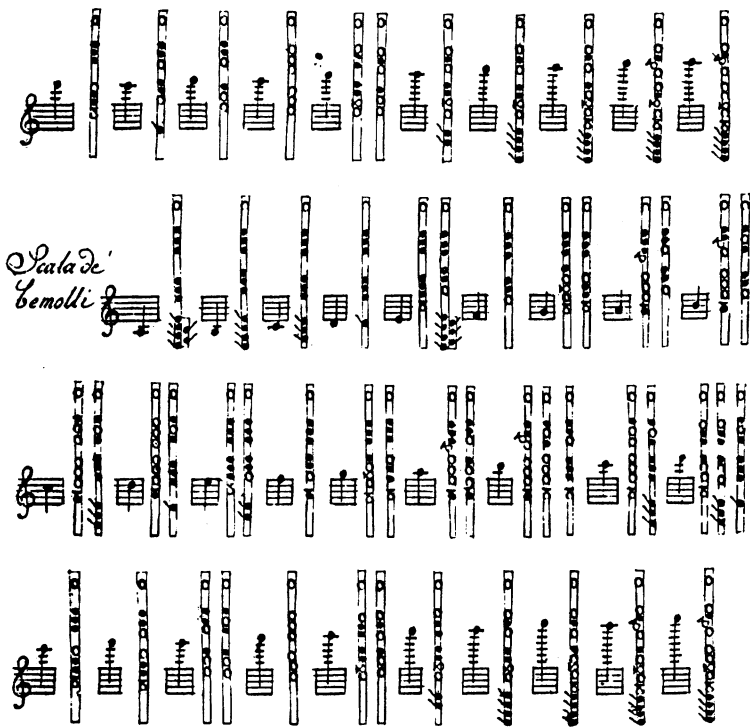


Fig. 2. – continued.

Orazi points out that this extension of the tube, as well as adding the ‘low notes of the violin’, helped to make the higher notes ‘easier and wider in range’.¹⁷ In fact, Fig. 2 shows that by correctly closing the holes of the extension and using certain note holes as vent holes, one could play right up to g''' . The highest note in the extant treatise literature is just d''' , as we infer not only from the above-mentioned alto flute of the *Encyclopédie* but also from the standard instruments of modern make.¹⁸ The exceptional results obtained on Orazi’s instrument could probably be ascribed to his addition of an extension, which determined a reduction in the diameter-length ratio of the bore and a consequent increase in the emission of the high harmonics.

¹⁷ [S, 5]: ‘più facile e di maggior estensione’. Even the *Encyclopédie...* (Paris, 1756), Vol. 6, p. 896 (‘Flûte Allemande ou traversière’) had already made a similar claim by asserting that the lower-pitched flute (hence the ‘Flûte d’amour’ or – better still – the ‘Basse de Flûte’), the easier it was to play the highest notes (b''' , c''' , d''').

¹⁸ On the modern flute see, for example, Howard Mayer Brown: ‘Flute’, in *The New Grove Dictionary of Musical Instruments* (London, 1984), Vol. 1, p. 772.

Expanding the instrument's range to four octaves ($g - g''''$) clearly made it more competitive with the violin, in perfect accord with contemporary aesthetics. Gianelli, in 1801, writes:

[The transverse flute] is that which in present-day orchestral music excels in the playing of soprano parts along with the violins and in the accompaniment of the voice. It has, in fact, a greater range than the other flutes; its tone has greater spirit, animation and variety.¹⁹

In his trios, however, Orazi restricts the range to a''' , a limit coinciding with that indicated by Quantz (1752) and Gianelli (1801).²⁰ The bass register, on the other hand, reaches down as far as f^\sharp , a note obtained – as he himself explains – by using the g fingering (all tone holes closed) and blowing not so hard [S, 11].

On the subject of the enharmonic genre, Orazi explicitly states that he wishes to divide the tone into four parts and the octave into 'twenty-four enharmonic diesis' ('ventiquattro diesis enarmonici') [S, 17]. According to his intentions, therefore, the octave was to be divided into twenty-four acoustically equal parts. This is indirectly confirmed by the fact that he makes no distinction between the diatonic and chromatic semitone: from his fingerings (see Fig. 2) it would appear that $C^\sharp = D^b$, $D^\sharp = E^b$, etc. The notation he uses is illustrated in Ex. 1 and Fig. 3.

From the practical point of view, the quarter-tones were produced exclusively by resorting to special fingerings. This avoided the complication of introducing yet further keys. Such an approach, Orazi observes, was particularly manageable on his flute, since the combinations obtainable with the instrument's seventeen tone-holes were practically 'infinite'. He does point out, however, that to obtain satisfactory tuning the calculation of the bore diameter had cost him a great deal of effort [S, 7].

Hence the addition of an extension permitted not only the emission of notes below d' , but also improved the tuning of both high-pitched and enharmonic notes. We know, however, that Quantz (1752) and Tromlitz (1791) had condemned the two additional keys for c^\sharp and c' : in their opinion they spoil the instrument's tone.²¹ (A possible scientific explanation for this is that they slightly lower the instrument's so-called 'cutoff frequency'.) It is worth conjecturing how those two distinguished writers would have judged the five keys Orazi added to the bass.

¹⁹ Pietro Gianelli: *Dizionario della musica sacra, e profana . . .* (Venice, 1801), Vol. 2, p.54: '[Il traversiere] è quello che a' nostri di regna ne' concerti per sonar soprano coi violini, e per accompagnare la voce. Infatti ha maggior estensione degli altri flauti; il suo suono ha maggior brio, vivacità, varietà.'

²⁰ See respectively: (i) Rockstro, *A Treatise*, p. 234 and (ii) Gianelli: *Dizionario*, p.54.

²¹ See: Rockstro, *A Treatise*, p.256.



Ex. 1. Notation used by Orazi for his subdivision of the octave into 24 quarter-tones.

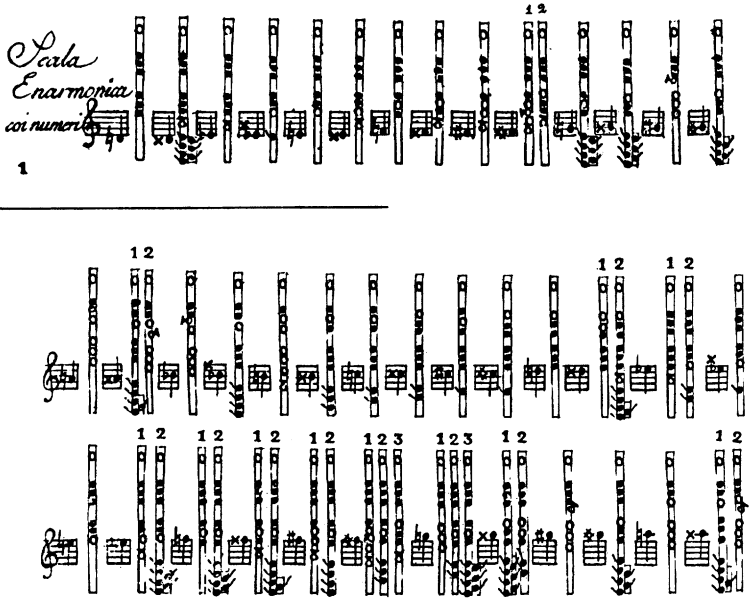


Fig. 3. Orazi, *Saggio*, 1797, detail of the fingerings for the enharmonic notes (in the original, the first row appears on Page 2, the other two on Page 3).

4. THE PROBLEM OF 'PORTAMENTO' ON THE FLUTE AND VIOLIN

Orazi's flute would seem to be the only wind instrument to have the octave divided according to the Equal Tempered System 24 (= ETS 24). Previously this tuning had been tried out on just two plucked instruments: Giambattista Doni's *Lyra Barberina* (c. 1630-33) and Jean Le Maire's *Almerie* (a particular type of lute mentioned by Mersenne in

1636-37). The clavichords of Girolamo Ruscelli (second half of the 16th century) and Georg Gebel (1685-c. 1750) also appear to have been based on the same division.²²

The only extant music is a work for three violins and violone by the Spaniard Francisco Valls (1665-1747); in it, however, only the diatonic semitones (*C#-D*, *D#-E*, *E-F*, etc.) are divided into two equal parts.²³ Orazi's pieces are therefore the only ones based on ETS 24. Unlike Doni and Della Valle, his intention was not to revive the ancient Greek genres, an operation which – he realistically commented – would have been like 'reviving the ancient knights errant' ('rinnovare l'antica cavalleria errante') [S, 16]. Instead he bases himself on a practice dating back at least to the early 17th century and illustrated by G.A. Angelini Bontempi (1695), according to which singers performed quarter-tones by 'dragging the voice' ('strisciandosi la voce'), in the manner, that is, of a 'portamento' [S, 7]. These 'crescimenti' and 'distendimenti' of the voice (expansions and distensions), which were features of the Roman school, are already found in the works of Ottavio Durante (1608) and Domenico Mazzocchi (1638)²⁴ and mentioned by theorists such as Fabio Colonna (1618: 'strisciata di voce') and G.B. Doni (1640: 'strascini').²⁵

The following evidence enables us to assert, without room for doubt, that this practice was extended to string instruments, again from at least the early 17th century. In the *Sylva Sylvarum* of Francis Bacon (1561-1626) we read:

We have no music of quarter-notes; and it may be they are not capable of harmony [...] Nevertheless we have some slides or relishes of the voices or strings, as it were continued without notes from one tone to another, rising or falling, which are delightful.²⁶

Over a century later, in 1736, Giordano Riccati affirmed that such glissandi (he calls them 'grace notes of charm [...] using the slide') are 'done the whole time by violinists and by singers'.²⁷ The practice was still alive in 1807, as we learn from Cervelli's above-mentioned report. Referring to the enharmonic genre he writes:

²² On Doni, Le Maire and Ruscelli, see: P. Barbieri, 'I temperamenti ciclici da Vicentino (1555) a Buliowski (1699): teoria e pratica "archicembalistica"', *L'organo XXI* (1983), pp.149-151. On Gebel, see Johann Mattheson: *Grundlage einer Ehren-Pforte . . .* (Hamburg, 1740), p.409. The information on the two clavichords, however, is extremely imprecise.

²³ See: (i) P. Barbieri, 'L'intonazione violinistica da Corelli al Romanticismo', *Studi musicali XIX* (1990), pp.362-363; (ii) Id.: 'Violin intonation: a historical survey', *Early Music XIX* (1991), pp.80-81.

²⁴ *Ibid.*

²⁵ See: Barbieri, 'I temperamenti ciclici', p.148.

²⁶ *Ibid.*, pp.148-9

²⁷ *Ibid.*, p.149: 'false di vezzo [. . .] per via di striscio' that 'si fanno tutto di da violinisti, e dai cantanti'. Riccati was also an amateur violinist.

There's no need to look for it in the dead, for we hear it in the living. Those inflections of the voice that singers make when they pass from one note to any another through almost imperceptible gradations, by both raising and lowering the note – those are what we call enharmony, even if they themselves may be unaware of the fact. Violinists do the same thing when they place the finger on a string and then slide it up to another note on the same string [. . .] Every good singing or violin teacher teaches his pupils how to perform these inflections. They cannot be played, however, on instruments with fixed keys, such as the organ and piano, those using tuned plates or wind instruments.²⁸

Hence Orazi's desire to give the flute the means of achieving these 'inflections of the voice'.

Performers are aware that an effect very similar to the glissando is easy to obtain on the clarinet but not on the flute.²⁹ So, in spite of Paisiello and Fenaroli's opinions on the subject, Orazi's idea was in perfect harmony with contemporary practice. After all, glissandi were to be written for the flute by composers such as Berlioz and Mahler, respectively in the *Symphonie Fantastique* (1830) and one of the *Rückert Lieder* (1901–04).³⁰

5. THE TWO ENHARMONIC TRIOS

Orazi's two trios were published in separate parts and do not require any other instrument to reinforce the bass [S, 5]. To give an idea of the compositional style, in Ex. 2 I have prepared a score of the *Grave* and *Allegro* of the first trio, maintaining the original notation (that illustrated in Ex. 1 above). Orazi also make use of themes and movements 'by good composers' ('di Autori buoni'), because – he claims – they make an excellent effect on the new instrument. The composers in question – all from the latter half of the 18th century – are Haydn, Misliveček and an otherwise unidentified Vogel [S, 8]. The key signatures never have more than one sharp or three flats. Not all the movements are in the enharmonic genre; those using quarter-tones are indicated below by an asterisk:

²⁸ [De, 21–22]: 'Or senza ricercarlo ne' trasandati, sentiamolo da' viventi. Quelle inflessioni di voci che fanno i cantanti quando da un tuono passano ad un altro qualunque in una gradazione quasi impercettibile, sì nell'aumento che nella diminuzione dell'acuto e del grave è appunto l'enanarmonico, malgrado che talora essi stessi lo ignorino. I violinisti fissano il dito su di una corda, e quindi striscandolo sulla medesima fino ad un altro tuono fanno lo stesso [...] Ogni buon maestro di canto e di violino insegna a' suoi allievi queste inflessioni perché vi si possono eseguire. All'opposto sono inesequibili in quegli strumenti a tasti fissi, come l'organo, il pianoforte, in quegli a lastre ed a fiato.'

²⁹ See: for example, Norman Del Mar, *A Companion to the Orchestra* (London, 1987), pp.112–113.

³⁰ Ibid.

Trio 1

Grave

1

7

11

Ex. 2. Orazi, 1797, *Trio no. 1*. The opening *Grave* and *Allegro*, in score (separate parts in the original).

15

Musical score for measures 15-18. The score is in 3/4 time and consists of three staves. The first two staves are for the vocal line, and the third is for the piano accompaniment. Measure 15 starts with a treble clef, a key signature of two flats, and a common time signature. The piano part features a triplet of eighth notes in measure 17.

19

Musical score for measures 19-22. The score is in 3/4 time and consists of three staves. The first two staves are for the vocal line, and the third is for the piano accompaniment. The piano part continues with a steady eighth-note accompaniment.

23 *Allegro*

Musical score for measures 23-26. The score is in 3/4 time and consists of three staves. The tempo is marked *Allegro*. The piano part features a more active accompaniment with sixteenth notes and eighth notes. There are some markings with asterisks and sharp signs in the piano part, possibly indicating specific performance techniques or corrections.

27

Musical score for measures 27-30. The score is in 3/4 time and consists of three staves. The piano part continues with a steady eighth-note accompaniment.

Ex. 2. - *continued.*

32

solo sotto voce

p

35

f

38

41

Ex. 2. – *continued.*

44

sotto voce

solo

p 3

48

f

p

f

f

p

52

f

56

p

p

f

tr

Ex. 2. – *continued.*

60

63

67

71

Ex. 2. – continued.

75

79

83

87

Ex. 2. — *continued.*

92

96

100

sotto voce

104

Ex. 2. – *continued.*

Musical score for measures 108-111. The score is in 3/4 time and B-flat major. It features three staves. The top staff has a melodic line with trills (tr) and a dynamic marking of *f* (forte). The middle staff has a similar melodic line with trills. The bottom staff has a bass line with eighth and sixteenth notes.

Musical score for measures 112-115. The score is in 3/4 time and B-flat major. It features three staves. The top staff has a melodic line with a *solo* marking. The middle staff has a similar melodic line with a *solo* marking. The bottom staff has a bass line with eighth and sixteenth notes.

Musical score for measures 116-119. The score is in 3/4 time and B-flat major. It features three staves. The top staff has a melodic line with eighth and sixteenth notes. The middle staff has a similar melodic line with eighth and sixteenth notes. The bottom staff has a bass line with eighth and sixteenth notes.

Musical score for measures 120-123. The score is in 3/4 time and B-flat major. It features three staves. The top staff has a melodic line with eighth and sixteenth notes. The middle staff has a similar melodic line with eighth and sixteenth notes. The bottom staff has a bass line with eighth and sixteenth notes.

Ex. 2. – *continued.*

1st Trio: *Grave**, *Allegro**, *Menuet*, *Trio* (the last movement is attributed to Haydn):

2nd Trio: *Andante** (on a theme attributed to Vogel), *Grave**, *Minué con 11 variazioni** (the theme and the first four variations are attributed to Misliveček; quarter-tones appear just in the theme and in the eleventh variation).

Of the three flutes, only the 'traverso principale' (also referred to as 'terzo traverso obbligato') reaches down as far as *g* (and, on one occasion, *f*[#]). With just one exception, the other two instruments never play below *c'*.³¹ The 'principal' flute is also that with the majority of the enharmonic passages and with the highest note (*a'''*). Hence it is quite likely that, for ease of performance, the second and third flutes could also be played by standard instruments (which would resort to 'forked fingering' whenever they encountered an enharmonic note). Besides, we have already noted that Orazi's wills mention just one enharmonic flute.

APPENDIX: SOME UNKNOWN EXPERIMENTS ON THE BASS FLUTE IN NAPLES

Paolo Anania de Luca's manuscript provides interesting evidence on the attempts to create a true bass flute and – indirectly – on two flute-makers working in Naples in the early 19th century: Cristofaro Custode and a certain Venbacher. The latter is hitherto unknown to the reference books.³²

It is important to stress that, because of its size, the bass flute (unlike the bass recorder) had always been a difficult instrument to make. Already in the treatises of Jeambe de Fer (1556) and Mersenne (1636-37) mention is made only of the flutes in D (= concert flute) and in G (pitched a fifth lower).³³ Some confusion is also generated by the fact that the French sources, at least from 1701, referred to the present alto-flute in G as the '*Basse de flûte traversière*'.³⁴

De Luca states that in 1806 he possessed the following types of flute [*De*, 4-5]: a 'tenore' (otherwise unspecified); a 'corista' (i.e. the customary 2' standard flute); a 'terzino' (probably pitched a minor third above

³¹ The exception is in the *Grave* of the second Trio, where the very last notes of the 'Traverso primo' part feature the following sequence: *b-b-c'-c'-b-c'-d'-d'-g'-g'*.

³² [*De*, 6-9, 26-27]. An otherwise unidentified 'Custode', however, is mentioned as working in Naples towards the end of the 18th century: see his entry in William Waterhouse: *The New Langwill Index: A Dictionary of Musical Wind-Instrument Makers and Inventors* (London, 1993).

³³ See Mayer Brown: 'Flute', p.777.

³⁴ See: (i) Joseph Sauveur: 'Système general des intervalles des sons...', *Histoire de l'Académie Royale des sciences*, année 1701, Planche III ('Flûte traversière' and 'sa Basse'); (ii) *Encyclopédie*, Vol.2, p.120; (iii) Gianelli, *Dizionario*, p.54.

the 'corista'), a 'sestino' (probably pitched a minor sixth above the 'corista') and an 'ottavino' (the 1' piccolo). In 1814 a Neapolitan friend gave him a 'flauto tenore': this time, however, he explains that it was in G, like the *Basse de flûte* of the *Encyclopédie*, but 'different from the *corista* flute just in size' (i.e. with no part of the tube bent back on itself).³⁵

Unable to find a true 4' bass flute (i.e. one pitched an octave below the 'corista'), in 1814 De Luca attempted to complete his 'consort' by commissioning one from Cristofaro Custode. As such an instrument was totally unknown even to the instrument makers, De Luca – purely on the strength of his acoustic knowledge – endeavoured to give Custode some practical advice. But the outcome of his enterprise was as follows:

Custode understood nothing of my theories, just as I knew nothing of his art. We had various discussions without reaching any agreement. He suspected that I was a bungler mischievously trying to learn the art of making flutes by pretending to teach it through methods of abstraction. I would notice the diligence with which he kept his tools out of my sight, the inactivity that came over him whenever I arrived and the confusion of his answers to even the simplest of my questions.³⁶

De Luca consequently left Custode to finish the job by himself. The flute he eventually received – an instrument based on that of the *Encyclopédie* (Fig. 4) – is described as follows:

Its shape and the materials it was made of corresponded to those indicated in the Encyclopaedia [= *Encyclopédie*]. Only in holes 1, 3, 4 and 6 was there a striking difference. For instead of being closed by keys, they were left bare as in ordinary flutes. And to enable the fingers to reach them they were cut obliquely so that they slope inwards: the 1st with the 3rd, the 4th with the 6th. The notes were all out of tune, very weak in the central scale and almost non-existent at the bottom.³⁷

Regarding this type of flute, in a private communication, Edgar Hunt has observed that the bent-round head joint is the weak spot in the

³⁵ [De, 9-10]: this second tenor-flute 'differiva dal corista per le sole dimensioni'. On the matter of larger and smaller flutes, see: Bate, *The Flute*, pp.183-193.

³⁶ [De, 6-7]: 'Custode nulla capiva delle mie teoriche, siccome io nulla sapeva dell'arte sua. Avemmo diversi abbozzamenti senza intenderci affatto. Egli sospettò ch'io fossi un imperito malizioso, che cercava istruirsi nell'arte di costruire i flauti fingendo di ammaestrare per le vie dell'astrattezza. Io me ne avvidi dalla diligenza con la quale sottraeva i suoi ferri al mio sguardo, dalla inazione in cui si metteva al mio arrivo, e dalla perplessità delle sue risposte alle mie più semplici domande.'

³⁷ [De, 7]: 'Le sue forme e la materia onde era composto corrispondevano a quelle indicate nell'Enciclopedia. I soli buchi 1, 3, 4 e 6 offrivano una differenza notevole. Essi non erano chiusi da chiavette, ma nudi come ne' flauti ordinari: e perché le dita avessero potuto pervenirvi, erano praticati obliquamente convergenti dalla parte esterna, il 1° col 3° ed il 4° col 6°. I tuoni erano tutti falsi, debolissimi nella scala di mezzo e quasi nulli al grave.'

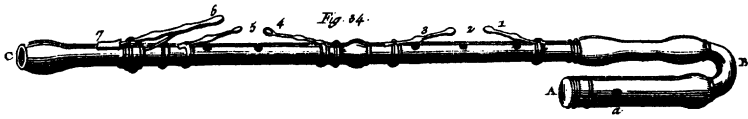


Fig. 4. *Encyclopédie*, 1751-67, Vol. 5 des Planches, Pl. IX, Fig. 34: 'Basse de Flûte traversière'. For ease of fingering – given the size of the instrument – the holes corresponding to the numbers 1, 3, 4 and 6 were closed by keys (due to an oversight, the engraver has omitted to indicate hole no. 4). In the flute built in Naples by Cristofaro Custode (1814), these holes were keyless. Instead they were cut obliquely into the body of the instrument to bring them closer to the 2nd and 5th hole.

instrument's design. The player does not need it to get nearer the keys for the lowest notes; they are extensions of the foot joint. The bent-round head destroys the balance between the player's chin and right hand thumb and little finger with the side of the left hand first finger as fulcrum between; the little fingers of the two hands have to fight over the footkeys down to *g* – as on a clarinet (see: Fig. 5).

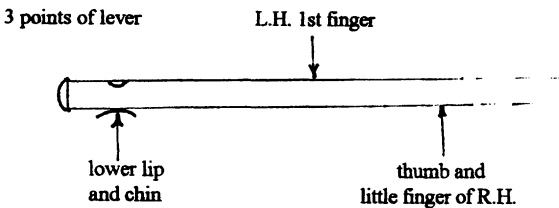


Fig. 5.

Seeing the disappointing results, De Luca decided to make one himself and underwent a short period of instruction from Venbacher, whom he respectfully calls 'mio maestro'. Venbacher, who was not as diffident as Custode, had provided him with certain 'mechanical instruments', including 'some models for fixing the external proportions and the positioning of the holes on the *corista* flute'.³⁸ First he practised by constructing a *corista* flute, until he found the results satisfactory. Then, in preparation for making the desired bass flute, he made a reproduction in

³⁸ [De, 26-27]: 'Fra gl'instrumenti meccanici ricevuti dal mio maestro Venbacher vi erano delle sagome destinate a determinare le proporzioni esterne e le distanze de' buchi del flauto corista.'

exactly double scale. This gave him an instrument that was very weak at the bottom, rather out of tune and too heavy. For a whole year (in 1814–15) he made further attempts, reducing the internal diameter little by little (in his final tests the diameters of the two extremities were the same as those of the *corista* flute). In this way he claims to have avoided the heaviness of the instrument but not – predictably – the weakness of the low notes [*De*, 26–27]. At that point he gave up the venture and devoted himself to constructing a new type of tonometer, which he was to illustrate in a memoir published in 1828.³⁹

In the course of the 19th century other instrument makers tackled the bass flute, but it was only in the early decades of the 20th century that the problem can be said to have been satisfactorily resolved.⁴⁰

Translation by Hugh Ward-Perkins.

³⁹ Paolo Anania De Luca: 'Memoria sopra un cordometro ed un tonometro', *Memorie di matematica e di fisica della Società Italiana delle Scienze*, XX – Part II (1828), pp.468–481.

⁴⁰ See Bate: *The Flute*, pp.189–190.